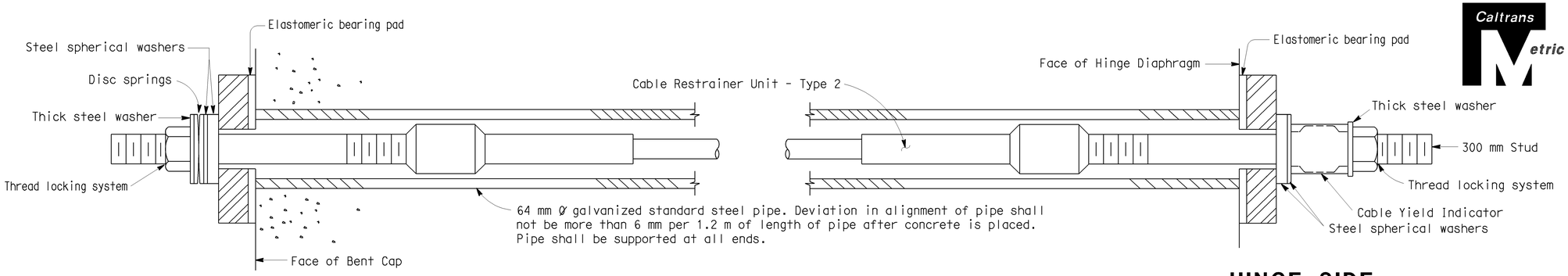


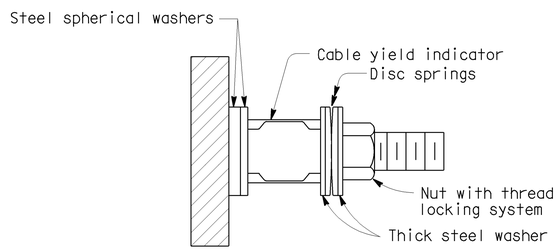
BENT SIDE

(Retrofit construction shown)

CABLE UNIT

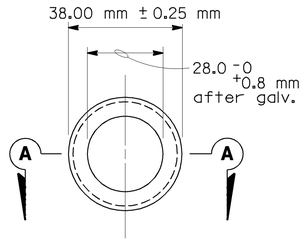
HINGE SIDE

(Retrofit construction shown)

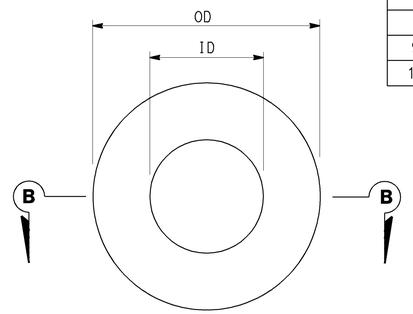


ADJUSTMENT END

(New construction shown)



END VIEW



PLAN

DISC SPRINGS AND WASHERS

"All dimensions in mm, except as noted"

	DISC SPRING					STEEL SPHERICAL WASHER			THICK WASHER		
L*(m)	ID	OD	†	H	COLOR CODE	ID	OD	Nom thick.	ID	OD	†**
0 - 7.6	25	50	1.6	3.3	WHITE	30	57	13	26	50	6.3
7.7 - 9.7	25	50	2.0	3.4	RED	30	57	13	26	50	6.3
9.8 - 11.5	25	50	2.4	3.6	BLUE	30	57	13	26	50	6.3
11.6 - 13.7	31	63	2.5	4.5	YELLOW	33	64	13	29	57	6.3

*For length L (m), see "Cable Restrainer Unit - Type 2" sheet **Minimum value

NOTE: All OD and ID dimensions for washers and disc springs shall meet the dimensional tolerances for harden steel washers, ASTM F436

RESTRAINER UNIT INSTALLATION PROCEDURE

NEW CONSTRUCTION:

1. Install Cable Yield Indicator, spherical washers, disc springs, nut and washers on the hinge side of restrainers as shown in "Adjustment End" detail. Disc springs shall be installed front to front as shown in "Disc Spring" detail.
2. Place only nut and washer on bent side of restrainers. Place thread locking system on bent side stud prior to installing nut and washers, and prior to setting the cable.
3. Tighten nut on the cable from the adjustment end of restrainer until the disc springs collapse and there is no disc gap remaining between the discs. The cable should be approximately straight with no sag.
4. See Item 5 of Retrofit Construction.

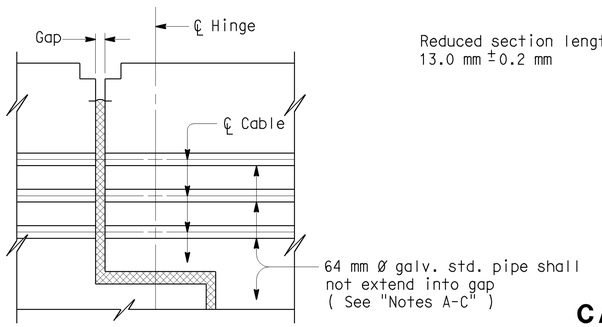
RETROFIT CONSTRUCTION:

1. Install disc springs on bent side of cable system using spherical washers to align discs to stud. Discs shall be installed front to front as shown in "Disc Spring" detail. detail. Install Cable Yield Indicator, spherical washers, nut and washer on the hinge side of restrainers as shown in "Cable Unit" detail.
2. If existing retrofit cables are being reused, 300 mm studs shall be installed.
3. Place thread locking system on bent side stud prior to installing nut and washers, and prior to setting the cable.
4. Tighten the cable from hinge side of restrainer until the disc springs at the opposite end collapse, and there is no disc gap remaining between the discs. The cable should be approximately straight with no sag.
5. Place thread locking system on hinge side stud after tightening the cable, but before backing off the nut. Back off the nut at hinge side a distance equal to maximum additional amount that the hinge joint is expected to open, relative to existing ambient conditions, as shown on the plans for movement rating.

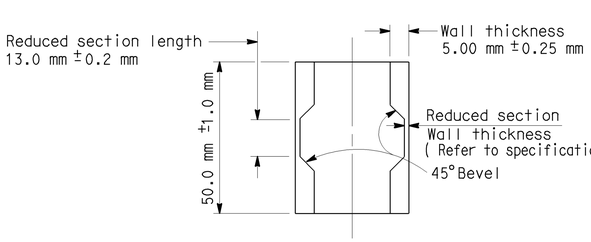
NOTE: If the cable needs to be secured from turning while tightening, use double nut locking technique on the stud to protect the threads.

NO SCALE

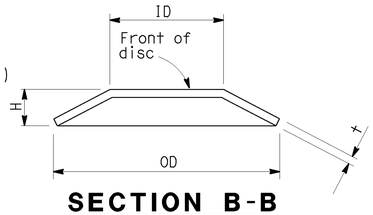
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN



HINGE DETAIL



SECTION A-A

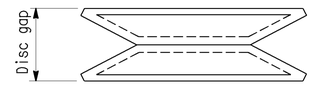


SECTION B-B

(Single spring)

CABLE YIELD INDICATOR

All dimensions are before galvanizing except as noted.



AS INSTALLED ON STUD

DISC SPRING

Note: For dimensions not shown, see table

NOTES:

A. The ends of pipe shall be covered or capped to prevent concrete and debris from entering the pipe until hinge concrete is placed.

B. Care should be taken to align the pipes on each side of the hinge.

C. All ends of pipes must be flush with or slightly recessed from the concrete. The inside edges of the pipes must be smooth to prevent fraying of cables.

DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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STANDARD DRAWING					
RELEASE DATE 4/20/98	DESIGN	BY S. SAHS	CHECKED R.J. ZELINSKI	RELEASED BY	
FILE NO. xs7-420	DETAILS	BY R. YEE	CHECKED R.J. ZELINSKI		
	SUBMITTED	BY R.J. ZELINSKI	DRAWING DATE 4/98	OFFICE CHIEF	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.

KILOMETER POST

CABLE RESTRAINER UNIT - TYPE 2 DETAILS

DS OSD 2147A (METRIC) (REV. 2/25/97)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET | OF

USERNAME => jsanchez

xs7-420.dgn

DATE PLOTTED => 16-JAN-2004 TIME PLOTTED => 15:30